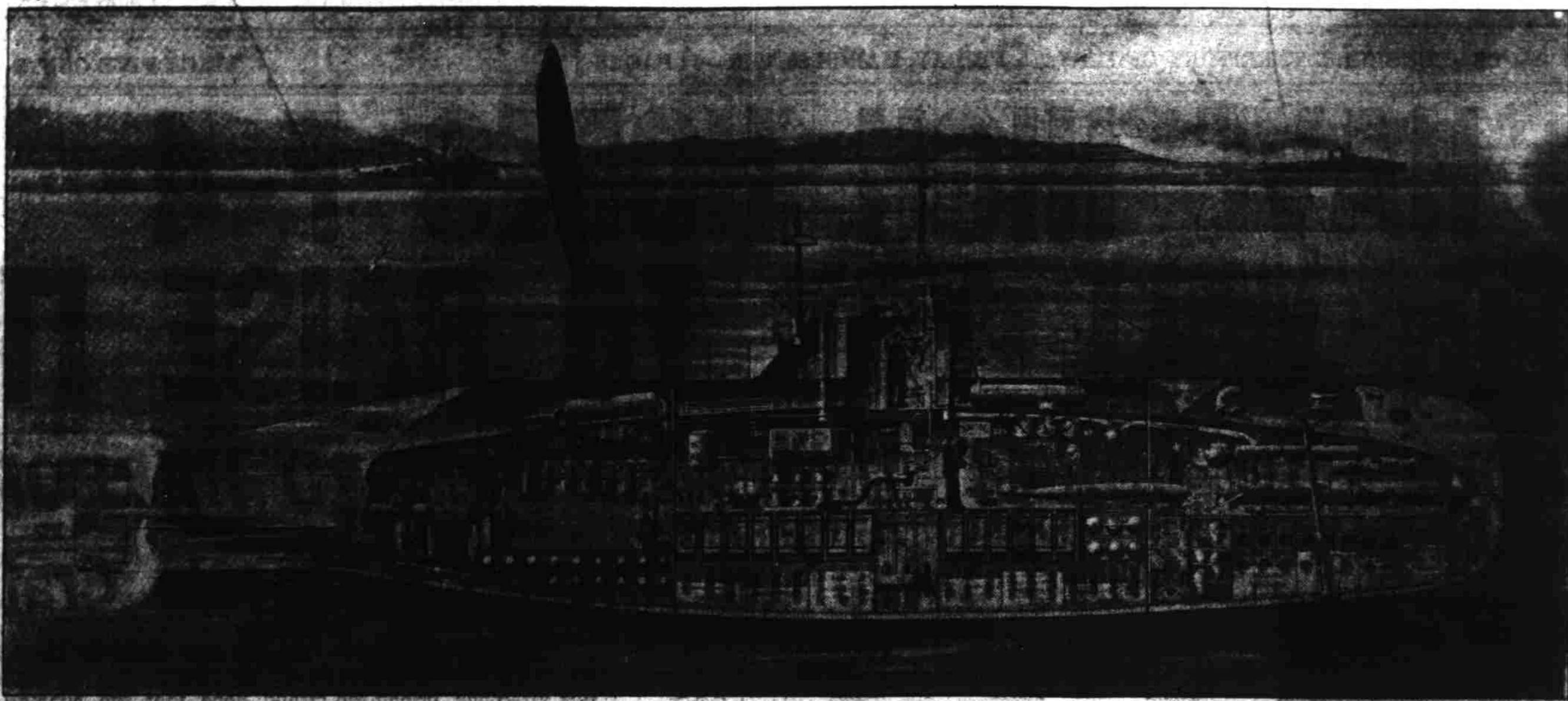


HUMAN IN GENUITY IS TAXED TO MAKE SUBMARINE SAFE



The photograph drawing above shows a submarine which in all material respects is similar to the F-4. The contour is the same, minor interior features being different. The boat is divided into three compartments, fore, midships and aft. The small room amidships, where the lower of the two men is shown standing, holds the men when the vessel is under water.

How F Class Submarines Are Constructed; Each of Three Compartments Independent

Submarines of the F class are divided into three watertight compartments. The forward third of the ship is the torpedo room; the midships compartment contains the storage batteries, periscope and instruments, while the engine room is aft. Ordinarily four men are stationed in the torpedo room, and four in the engine room, while the officers and balance of the crew are in the midships compartment.

While submerged the bulkhead doors are not kept closed, as it is necessary for the navigation of the ship to transmit orders throughout the entire length. Men are stationed at the doors, however, and in case of

accident to any compartment, the men in that section are expected to make good their escape before the doors are locked. If, however, the men in a damaged compartment were unable to get to safety, the doors would be closed on them to insure the safety of the others.

The greatest depth to which any submarine has ever been submerged is 287 feet, made by a boat of this group, the F-4, before coming to these waters, but although soundings at the spot where the F-4 is supposed to be reach almost those figures, it is not generally believed that the submarine has been destroyed by excessive pressure. The opinion among

those in the best position to judge is that some minor accident has rendered the boat helpless, and that she lies on the bottom of the ocean with her imprisoned crew in hourly hope of rescue.

This thought is the spur by which officers and men above have outlasted exhaustion during the incessant labors of the past 24 hours.

The greatest danger to men imprisoned in a submerged submarine is from the chlorine generated by the action of salt water on the batteries. If sea water has entered the midships compartment, the chances of finding any of the crew alive, even though the craft can be located and raised, are very slim.

Can Aviator Fly Over Sea And Locate F-4?

Plan Is Proposed to Thomas Bradshaw and He Gets Up From Sick-Bed to Make Ready Partly-Assembled Aeroplane—Make Take-Off For Preparation

Will an aviator of Honolulu be able to soar over the sea just beyond the harbor and see to the bottom where the F-4 is believed to be lying?

That is a possibility, that arose last night and which human energy and skill today are striving to transform into an actuality.

Frantic hopes of the wives and relatives of the 31 men imprisoned in the F-4 are put in the ability of William Bradshaw, an amateur aviator, to get his partly-assembled aeroplane into the air before the lives of those in the submarine are snuffed out 35 fathoms beneath the surface.

Scientists and aviators agree that an aviator flying a certain height over 35 fathoms of water off the harbor can plainly see objects of the size of the F-4 at the bottom of the sea. On the ability of Bradshaw to get his machine into condition and to locate the submarine from his aerial viewpoint probably rests the lives of 31 men.

Bradshaw, it will be recalled, purchased a partly-wrecked aeroplane from the war department several months ago. He repaired the machine and was about to demonstrate his aviator's skill.

American submersible of the latest type.

Until lately most under-water boats were driven upon the surface by means of explosive engines using gasoline. This volatile fuel has caused a large number of the accidents registered against submarine flotillas. The French have tried to overcome this difficulty by using steam engines, steam being generated in boilers heated by crude oil. While quite admirable for surface running, this method has some serious drawbacks when the boats are sealed for submerged work. As an offset, engineers have evolved a heavy-oil engine of the Diesel type. The storage of the fuel and its use greatly lessens the dangers due to the presence and employment of explosive gasoline. To this extent, therefore, the modern under-water craft has become a safer vessel.

But there still remains the storage battery from which energy is well-nigh universally drawn for submerged navigation. The storage battery generates a noxious gas when reaching its full charge or when approaching the limits of its discharge. This gas is highly inflammable and becomes explosive when mixed with sufficient air, and upon a number of occasions has caused injury and disaster aboard submarines. This is bad enough, but the storage battery is another possible source of peril. Should a submarine sink and salt water get into the accumulators, deadly chlorine gas is immediately given off. This has probably rendered the crews of under-water boats unconscious, thus disabling the men who might otherwise have had time to perform the needful operations in order to bring their craft to the surface and thereby save their lives.

When running submerged, the men inside a submarine are, indeed, gambling with fate, because any sudden accident or rupture admitting a comparatively small quantity of water would suffice to send the boat quickly bottomward. To be sure, our submarines are tested for hull strength by a submergence to a depth of 200 feet; but one does not have to go far off some parts of our coasts to find water several times deeper, and it is there the biggest of these submarines would probably have to do duty in time of war. The prospect is a gruesome one should one of the vessels go down in 300 or 400 feet of water.

The submarine is safer than it used to be, but not safe by any manner of means, and for that reason our officers and jacksies volunteer for this duty, and the enlisted man is paid a bonus for the time he spends submerged in the dangerous craft.

When a mandate from the government enjoined all from flying. The amateur birdman took the machine apart and stored it in the Lewis stable on King street.

Early this morning, after the plan to fly over the outer harbor in search of the submarine's location had been discussed, Bradshaw and E. H. Lewis hurriedly packed the aeroplane parts on a truck and hauled the air machine to Anahulu, where both men, assisted by several mechanics, are now busy striving to beat the pace of death.

It was given out today to the Star-Bulletin that it will take 24 hours to assemble the machine. On that estimate it will be at least 9 o'clock tomorrow morning before the flight can be started. Bradshaw is suffering from the dengue fever and he voluntarily left his sick bed to aid in the rescue of the F-4 and its crew. The governor has promised to give his consent to the flight, it was announced today.

A law has just been passed by the legislature prohibiting flights unless with the consent of the governor. This law was passed for military defense reasons.

SUBMARINE BELL HELP TO CRAFT, SAYS AN EXPERT

The use the "submarine bell," which has come into comment with the loss of the submarine F-4, is explained by an expert as follows:

The submarine bell, as perfected, consists of a bell hung under water, and in apparatus aboard ship for hearing it and locating the direction whence it comes. It is used on lightships, exposed reefs, and buoys for the guidance of ships in darkness and thick weather. The equipment of vessels with its telephonic receivers extends through the great liners down to the smallest coasting vessels. A number have been installed in China and Japan and these waters will soon be as well protected as any in the world. The striking of the bells is automatic. A pneumatic mechanism operates those at the lightships. An electric device through a cable from shore rings those which mark dangerous reefs and an automatic mechanism, operated by the waves, is suspended from buoys, where there are no lightships and the distance from shore is too great for the use of an electric cable.

For receiving the signal on each side of the ship, near the bow and well below the water line, is a small cast-iron tank filled with water, in which hang two microphones. The sound waves from the bell coming through the water passes through the skin of the ship, enters the water in the tank and is picked up by the microphones. From the tank to the bridge or charthouse an electrical connection is maintained. When the sound of the bell is picked up the exact direction is easily ascertained by swinging the ship toward the side on which the sound is louder until it is equally loud on both sides. The ship is then pointing directly at the bell. Water is a trustworthy messenger and it never fails to deliver the message.

"So mighty is the modern ship that the buffeting of the storm itself can hardly delay its passage, providing the navigator can be sure of his whereabouts. The submarine sign gives him this assurance and its saving of life, property and time makes it, like

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Two Sisters, Wives of Men on F-4, Cruelly Torn With Anxiety

In a small cottage at the corner of Alapai and Boretania streets, Mrs. Frank C. Pierard was found consoling her younger sister, Mrs. Archie H. Langer, a bride of one month, this morning. Both are wives of members of the F-4's crew.

When a representative of the Star-Bulletin inquired at the cottage this morning he saw a sight that left an impression which will not be forgotten. Mrs. Langer, who looked more like a child than a wife and who married the son's mate of the F-4 on February 6, 1915, at Honolulu, rested in the arms of her older sister, Mrs. Pierard.

"Oh, if I only knew 'Frank' and Archie weren't suffering, that they had met a sudden and easy death, it would be such a relief," sobbed Mrs. Pierard.

Her sister was too much overcome to speak. The older sister picked up her two twin babies, whose innocent faces looked on with manifest curiosity.

According to the story told the Star-Bulletin by friends, Mrs. Pierard married the son's mate of the F-4 five years ago. When her husband was received to Honolulu a few months ago and they had taken up their residence at 617 Boretania street, Mrs. Pierard invited her younger sister, Mrs. Langer, to visit her. While here the sister was introduced to Archie Langer and soon afterwards, on February 6 of this year, Langer married the "little sister."

"We were so happy out here in Honolulu," Mrs. Pierard added, "and it comes very hard on my sister to lose her husband of a few weeks."

TWO MEN OWE THEIR LIVES TO MERE CHANCE

James M. Hogger of Macedonia, Missouri, escaped the fate of his mates the crew of the F-4 by being on shore duty yesterday. Whenever the submarine was out for target practice or maneuvers one man is left on the wharf as watchman. By chance it happened that yesterday was the day for F-4 to furnish the guard and Hogger was chosen. To that chance he probably owes his life.

Another who escaped is Arthur Mellett, who was until recently chief machinist of the F-4 but was transferred to the F-3.

SOME SUBMARINE FEATS ACCOMPLISHED IN U. S.

On September 20, last, the submarine Ed, at Newport, R. I., running 12 feet below the surface, accomplished a wonderful feat of torpedo marksmanship by scoring two center hits with torpedoes on a 10-foot moving target 3000 feet distant.

An item published in this paper on June 24, last, stated that it was known that the plans for three submarines the compass, the chart and the wireless, a factor in the comfort and profit of the world's shipping.

LIEUT. EDE NEW IN SUBMARINE SERVICE

Lieut. Alfred L. Ede, commander of the missing F-4, was just recently appointed to the submarine service and received his commission as a junior lieutenant. He was born at Truckee, Nevada, 27 years ago and was appointed to Annapolis in 1905. Later, as an ensign, he was appointed to the West Virginia. Soon afterwards he was detailed to the submarine service and before coming to Honolulu eight months ago, he was in command of the sunken F-4 at Mare Island and Vallejo, Cal.

Mrs. Ede has remained at their residence, 1309 Laniallo street, since the announcement of the disappearance of the submarine. She is distracted and could not talk to the Star-Bulletin. Friends in the naval service are in attendance. Mrs. Ede is the daughter of an ex-state treasurer of Nevada. Her maiden name was Miss Margaret McMillan.

authorized by the previous Congress contemplated vessels much larger than any now in commission, adding: "Although the pioneers in the art of submarine navigation, as in the field of aviation, the United States navy has been outstripped by European engineers in the matter of size, speed and offensive power of the submarines. So the naval designers now are planning much larger and more formidable vessels of that type. Some of them profess the development of the submarine into a giant battleship that will replace the dreadnoughts in the first line of defense, and be capable of temporarily disappearing beneath the surface of the sea to escape a return fire after discharging its great 12-inch rifles at an enemy."

GAMBLING WITH FATE IN A U. S. SUBMARINE; DANGER UNDER WATER

"Gambling With Fate in a Submarine" is graphically described in the Technical World Magazine by Robert G. Skerrett, a well-known expert. He says:

Can the submarine be made safe? This question is asked whenever anything happens to one of these vessels, and, unfortunately, the query has been justified a good many times since this modern order of fighting craft came into being.

For ordinary navigation the submarine is designed to travel upon the surface of the water very much as any other craft, and in this condition it would take a good many tons of water to sink her. When prepared for under-water navigation she actually has in her ballast tanks almost enough water to carry her to the bottom. We say "almost" because the added amount necessary is her remaining margin of safety—a measure of floating ability which the technical man calls "reserve of buoyancy." This reserve of buoyancy is the inherent impulse to rise to the surface should the

motors stop, and it is against this lifting force that the propellers exert themselves in driving and in keeping the boat beneath the sea.

A submarine which displaces on the surface 300 tons would be a boat about 150 feet long. When the ballast tanks of this vessel are filled and she is ready for submerged service, her deadweight or displacement becomes a matter of 520 tons, and holding this craft to the surface is a reserve buoyancy representing a space that would take just about 800 pounds of sea water to fill. In other words, she is suspended by a buoyant thread that is to the total weight of the submarine what seven ten-thousandths is to one. It would take less than 100 gallons of water, entering by some chance leak to start the vessel bottomward like a shot. Thus was the A-7 of the British navy lost a few months ago; and in this fashion a boat of the Russian service and one of the German navy were sunk but, fortunately, their crews were rescued with a sacrifice of only three lives. Both of these boats sank

Ten Days

If it's coffee that is causing your nervousness, headache, heart flutter, biliousness, or sleeplessness, and you want to keep on with these troubles another year, why—stick to coffee!

(It's an established fact that the poisonous drug, caffeine, in coffee causes these and other ills.)

But if you want to know the joys of freedom from coffee troubles, quit coffee and use

POSTUM

—the delightful pure food-drink—

Made from prime wheat and a bit of wholesome molasses and free from caffeine, or any other harmful substance.

Usually a ten days' change from coffee to POSTUM is sufficient to convince most coffee drinkers that

"There's a Reason" for Postum

As a general rule the submarines in the United States' service are towed on long trips and are invariably accompanied by another ship when venturing for any distance over the sea. In striking contrast to this state of affairs is the really extraordinary voyage of a submersible built after the design of M. J. Laurenti for the Swedish government. The Hydra is a boat of only 135 tons displacement, and yet without an escort of any sort she traveled practically 3000 miles from the shipyard at Spezia, Italy, to Stockholm. During that journey she encountered a good deal of rough weather, and yet she went steadily onward, making her port of call like any other seagoing craft of much larger size.

The French have done notable things of late in keeping the sea and in running long distances in their submersibles, but it must not be forgotten that their boats range all the way from 400 tons to nearly 1000 tons in displacement. The closest approach to this character of vessel are the under-water craft developed by Mr. Simon Lake, the G-1, built by him for our navy, being a fine example of the



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